Space Weather Forecast

Issued on Saturday, 19 August 2023 at 01:10 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated Moderate-class X-ray flares and R1 Radio Blackouts throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity remained low through the UTC day of Friday 18 August, with isolated Common-class flares peaking at 18/1930UTC from an active region in the northwest. A second similar-sized flare emanated from the same region at 18/2135UTC. The larger event was tied to a Coronal Mass Ejection (CME) - ejecting an arc of plasma (filament) that has yet to be analysed - but may carry an Earth-directed component given its emission location. X-ray activity was otherwise lower than in recent days.

There are currently up to ten sunspot regions on the Sun, with a new region possibly becoming visible near the southeastern solar horizon. All of the current front-sided active regions were either stable or in decay, with the exception of the peak flare-producing sunspot group and another lying near 40W.

The aforementioned peak flare produced a CME that has yet to be analysed. No other potentially Earth-directed CMEs were detected in available imagery.

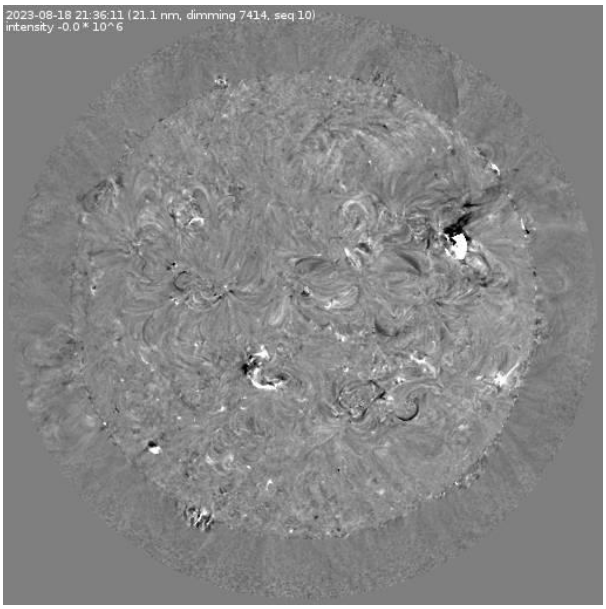

Figure 1: SIDC ROB time-integrated extreme UV dimming showing a possible CME emanating from the northwest of the Sun at 18/1930UTC (upper right). This has yet to be analsyed - pending imagery - but may carry an Earth-directed component.

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Solar Wind / Geomagnetic Activity: The solar wind suggests Earth is transiting a sector of space characterised by a fast wind as of 18/0200UTC, with this preceded by a Co-rotating Interacting Region (CIR - a forerunning increase in solar wind density before a coronal hole fast wind).

Solar wind speeds rose from background levels, making step-wise increases in the fast wind regime to peak at slightly elevated levels after 18/0730UTC. The number of particles in the wind peaked early in the 24 hours in the CIR, subsequently declining into its typical background range as the UTC day continued. The associated magnetic field peaked at the fast wind's onset, subsequently moderating by the period's end. The north-south component was volatile within this envelope, but not spending protracted periods either co- or anti-aligned with Earth's field (to lesser or greater effect respectively).

The net result of the above solar wind measures was for provisionally mainly quiet geomagnetic activity.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Activity is most likely to remain low, but perhaps show an uptick with the arrival of some far-sided groups (that were highly active as they left the Earth-facing side) into the new UTC week.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs feature in the forecast, and the sole fast wind is the incumbent one. This fast wind has now likely peaked, and a largely quiet forecast period is expected, especially by the new UTC working week.

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

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Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	25	30	30	30
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	2	2	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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